

People flee Kosovo as NATO assault moves on

November 2000

LEADING EDGE

Hope fades for peace

INTEL

JDAM, AGM-130 weapons of choice

Team Eglin accelerates weapons programs for the Balkan conflict

Depicted is a Joint Direct Attack Munition during a recent test at China Lake, Ca. This was a common sight during recent JDAM missions in Operation Allied Force as JDAM found their targets with devastating accuracy.

Peace accord reached

Cover Stories



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Cover by Capt. CK Keegan

4 - 15 *It all begins with Intelligence*

Try explaining what intelligence is to someone else. How would you describe the role intel plays in today and tomorrow's Integrated Weapon System Management process? Turn the page to gain a better understanding of AFMC intelligence support before filing this edition away for your future reference.

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TEST AND EVALUATION

First JSF lands at Edwards

EDWARDS AIR FORCE BASE, Calif. — One version of the Joint Strike Fighter, or JSF, program made its first flight early on the morning of Sept. 18.

Boeing's X-32A demonstrator landed here after making a 20-minute, 30-mile hop from the company's aircraft facility in nearby Palmdale. The quick flight, which reached 10,000 feet, went smoothly according to Boeing JSF chief test pilot Mr. Fred Knox.

"The airplane is a pleasure to fly," he said following the delivery. "It is already showing the precise handling qualities we expected based on hundreds of hours of simulator work."

During the flight, Mr. Knox put the X-32A through several initial airworthiness tests, including flying qualities and sub-systems checkout.

Another demonstrator for the JSF program, Lockheed's X-35A, is expected to arrive here within a few weeks. The Department of Defense is requiring JSF X aircraft to successfully meet three objectives: commonality and modularity among JSF variants; low-speed handling quality features for carrier flight; and short takeoff and vertical landing.

Both the X-32A and X-35A will be flown here for five months, with each making approximately 50 test flights totaling nearly 200 hours to validate the fighters' flying



qualities and performance for conventional and aircraft carrier operations.

The JSF aims to have a single tactical fighter used by the Air Force, Navy, Marines and England's Royal Air Force and Navy. It is meant to replace the aging F-16 Fighting Falcon, the A-10 Thunderbolt II, the AV-8B Harrier and F/A-18 Hornet. Some 3,000 of the fighters will be built for U.S. and British forces. Another 3,000 will be built for other allies.

The cornerstone of the JSF program is affordability by reducing development cost, production cost and the cost of ownership.

— Mr. Ray Johnson, AFFTC Public Affairs

TEST AND EVALUATION

Boeing begins flight-testing F-22 avionics

EDWARDS AIR FORCE BASE, Calif. — Boeing recently began flight-testing the F-22 avionics block three integrated software on its 757 flying test bed in Seattle, Wash.

Meeting this milestone keeps the program on track for software delivery by the end of 2000. The Defense Acquisition Board requires block three software to fly on an F-22 Raptor before year end in order for the program to receive its initial production contracts.

Software testing will include the use of multi-sensor fusion and F-22 radar and electronic warfare integration, enabling avionics engineers to identify, evaluate and resolve anomalies and make adjustments to avionics software and hardware prior to delivery to the F-22 Combined Test Force at Edwards Air Force Base, Calif.

— Reported by Mr. Ray Johnson, AFFTC Public Affairs

Osprey arrives at Edwards

EDWARDS AIR FORCE BASE, Calif. — A CV-22 Osprey, piloted by

Maj. Tom Currie, arrived at Edwards Sept. 18 after a six-hour flight from the Bell Helicopter Flight Research Center, Arlington, Texas. It stopped once for a refueling at Kirtland AFB, N.M.

The Osprey's landing marks the beginning of a two-year test program that will employ nearly 200 people in the CV-22 Integrated Test Team.

The aircraft will enter a flight test program scheduled to end in August 2002. Its electronic warfare suite will be tested in the Benefield Anechoic Facility.

Additional features being tested include a multi-mode radar for terrain following and terrain avoidance, radar jamming and integrated radio frequency countermeasure capabilities and special auxiliary fuel tanks not found in a Marine version of the aircraft.

Maj. Currie, the CV-22 government flight test director, said the Osprey combines the best of both helicopter and fixed-wing features. It has the vertical takeoff, hover and vertical landing qualities of a helicopter with the long-range fuel efficiency and speed characteristics of a turboprop aircraft. "Operationally, it gives Air Force Special Operations Command an ability it's never had before," he said.

The Air Force plans to buy 50 CV-

22s to replace its existing fleet of MH-53J Pave Low helicopters and plans to take delivery of them in 2003.

— Reported by Mr. John Haire, AFFTC Public Affairs

Moving surface target enters second phase

ROME, N.Y. — The second phase of a research program increasing ability to target moving ground targets is scheduled to begin this fall under the guidance of scientists and engineers at the Air Force Research Laboratory Information Directorate.

The Affordable Moving Surface Target Engagement program, or AMSTE, funded by the Defense Advanced Research Projects Agency, is designed to investigate and develop technologies to affordably engage moving surface targets such as tanks, tactical ballistic missile transporters and small boats.

AMSTE II consists of a series of experiments to investigate critical technologies, explore performance boundaries and demonstrate potential operational utility. AFRL is the lead agency for this program.

— Information supplied by AFRL Public Affairs



Col. Richard Siebert
Chief, Applications Division
AFMC Office of Intelligence

**"It all
begins
with
Intel"**

"It all begins with intel." The now famous quote from Gen. Buster Glosson (ret.), former Air Staff deputy chief of staff for plans and operations, is a fitting place to begin this issue of the *Leading Edge*.

Intuitively, we all think we know what intelligence is, but try explaining it to someone. How would you describe the role intel plays in today's Integrated Weapon System Management, or IWSM, process? And, you may ask, why worry about it before the system is fielded? I hope that by the time you finish reading this issue of the *Leading Edge* you will have a better understanding of the role of intelligence support to IWSM.

Maybe you'll even file this copy away for future reference. Our goal is that the next time anyone in the command has an intelligence-related question they can't answer, they will pick up the phone and contact their local intelligence experts.

Air Force intelligence doctrine states; "Intelligence provides clear, brief, relevant and timely analysis of foreign capabilities and intentions for planning and conducting military operations. The overall intelligence objective is to enable commanders and combat forces to know the enemy and operate smarter. This helps commanders across the range of military operations by collecting, analyzing, fusing, tailoring and disseminating intelligence to the right place at the right time for key decision making."

How do we translate that down to provide intelligence support to the warfighter through the systems Air Force Materiel Command develops and maintains?

That's where AFMC's Director of Intelligence comes into play. In addition to the small staff of 25 military and civilian personnel at headquarters, there are directors of intelligence, or DIs, at each of the product, logistics and test centers and lab research sites. While these intel professionals report and respond within their center chain of command, their functional guidance comes from the command's senior intelligence officer, Col. James Myers.

Intelligence support to AFMC

The mission of the command is to develop, acquire, support and maintain superior weapon systems. That means making sure direct timely intelligence support will be there for current and future weapon systems.

The intelligence community doesn't have a crystal ball to divine a program's intelligence needs. They have to learn about them the old-fashioned way – through the complete and accurate documentation of system intelligence requirements.

"Intel's not a free lunch, it doesn't just appear out of thin air when a new system is fielded," said Col. Myers. "Someone has to ensure that the program intelligence support requirements are identified early in the process, and that those requirements are passed to the intel community."

Much like other military services, the intelligence community must plan, organize, train and equip its people in order to provide intelligence data with enough lead-time for their customers to plan, program, budget and execute solutions for those requirements. Otherwise, we are at risk of fielding nice new shiny toys that will have to sit on the shelf waiting for the intelligence data necessary to employ them as effective and survivable weapon systems.

And that brings us to the bottom line. The challenge is to develop and implement the policy and procedures that ensure system intelligence support requirements are identified and documented within the IWSM process, then ensure those requirements are understood and adequately addressed by the intelligence community.

Defense Intelligence Agency director, Vice Adm. Thomas R. Wilson summed it up this way: "The more and better intelligence we can provide, the more and better intelligence commanders want, and that's exactly the way it should be."

The national intelligence community

The national level intelligence community is made up of one national-level agency — the Central Intelligence Agency, and agencies and offices from five U.S. governmental departments. The Director, CIA serves as the focal point for national level intelligence issues. Below is an overview of DOD agencies supporting integrated weapon system management.



The National Security Agency. With the assistance of the military services — collects, processes and reports signals intelligence to the intelligence, policy and operating elements of the government.



The Defense Intelligence Agency. Ensures the effective acquisition and application of all-source intelligence collection resources to satisfy both current and future DOD requirements — including support to military operations in peacetime, crisis, contingency and combat; weapons system acquisition and planning; and defense policy making.



The National Imagery and Mapping Agency. Responsible for the collection of imagery through the use of both national and commercial assets. It also advises others responsible for collecting imagery using theater and tactical reconnaissance assets. NIMA produces accurate and timely imagery, imagery intelligence, and geospatial information in support of the nation's military forces, policymakers and civil customers.



The National Reconnaissance Office. Designs, builds and operates the nation's reconnaissance satellites. The imagery and signals intelligence gathered by satellites warn of potential trouble spots around the world, help plan

military operations and alert the United States and its allies of possible attack and other threats against them. Appointed by the President, the Director of the NRO also serves as Assistant Secretary of the Air Force for Space and reports to the Secretary of Defense, who, in concert with the Director of Central Intelligence, is responsible for managing and operating the NRO.

Air Force Intelligence. Each military service collects intelligence information within its specialized fields of competence — including information that would help warn against hostile military action, both strategic and tactical — in response to established national, departmental and operational command requirements. Air Force Intelligence is headed by the Director of Intelligence, Surveillance and Reconnaissance, or HQ USAF/XOI, who manages the Air Force signals, measurements, technical, human and imagery collection efforts. Maj. Gen. Glenn Shaffer currently serves as that senior intelligence officer for the Air Force.



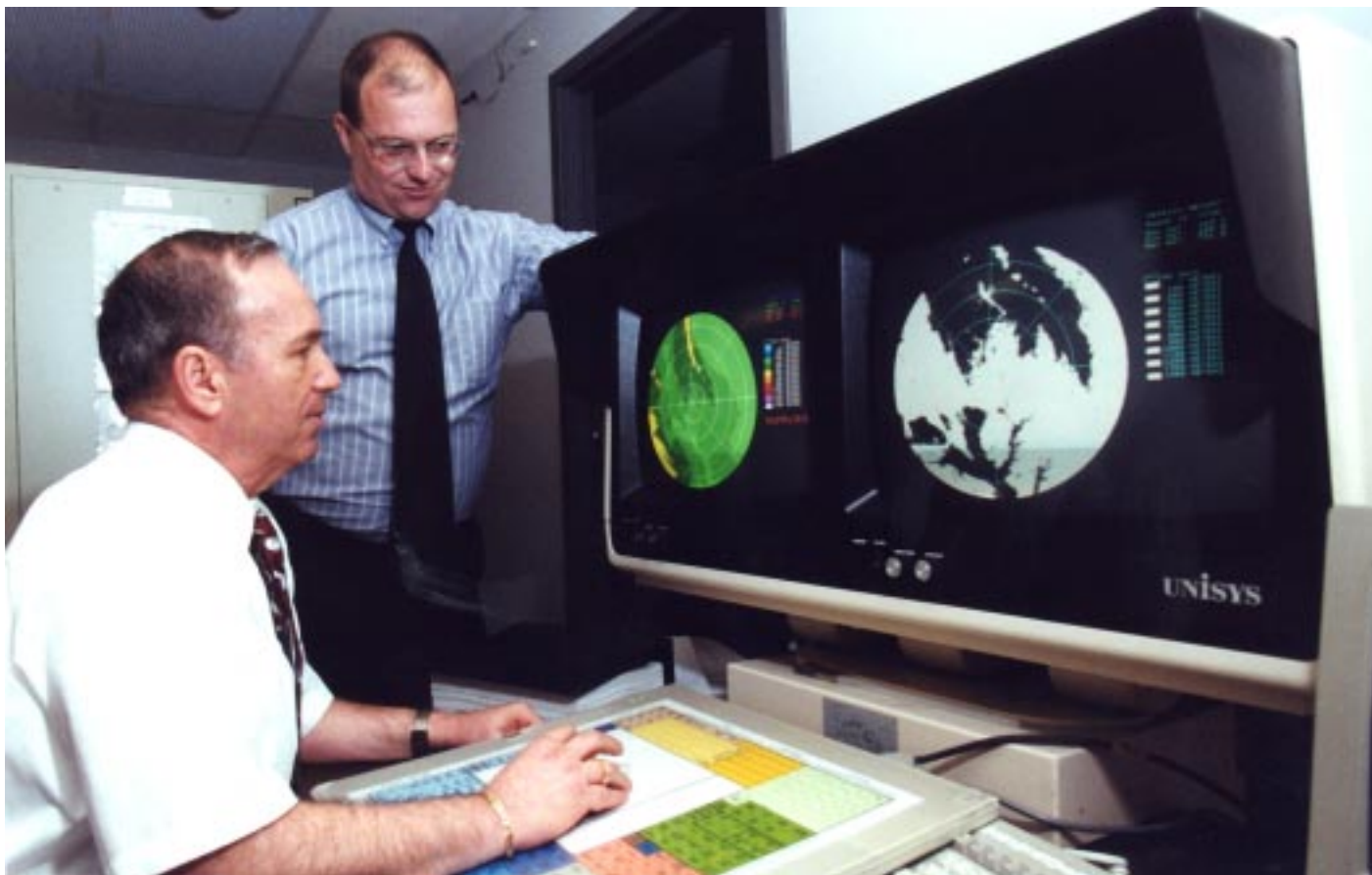
Air Intelligence Agency. An Air Force field operating agency, AIA's mission is to gain, exploit, defend and attack information to ensure superiority in the air, space and information domains. It delivers flexible collection, tailored air and space intelligence, weapons monitoring and information warfare products and services.



The Office of the Secretary of Defense. Develops intelligence policy and oversees intelligence personnel management issues for the services through the Assistant Secretary of Defense for Command, Control, Communications and Intelligence. Specifically, the office of the Deputy Assistant Secretary of Defense for Intelligence headed by Mr. Christopher Mellon, is the focal point for intelligence policy, technology and evaluation, and is the intel liaison with OSD and external partners.



The National Air Intelligence Center. Subordinate to AIA, processes and analyzes data on foreign aerospace capabilities and provides products in support of operational, acquisition and policymaking customers. NAIC also provides weapon-system-unique intelligence for targeting and mission planning. Imagery intelligence is collected and processed by designated units in response to national and theater requirements. The vast majority of intel production supporting weapon system programs is done by NAIC. AFMC is their largest single customer.



The impact of the Tinker Air Force Base, Okla., Intelligence Office reaches past Tinker's gates to Next Generation Weather Radar, or NEXRAD, operational support facility. Tinker's senior intelligence officer, Mr. David Carlson, right, views maps with NEXRAD software systems analyst, Mr. Ronald Guenther. NEXRAD relies on Mr. Carlson's geographical maps, detailed with airways, restrictions and prohibited areas, which are then used for meteorology and other needs of the Department of Defense, Commerce and Transportation. (Photo by Ms. Margo Wright, OC-ALC)

Guardians of intelligence

Directors play critical role in support of operations

Air Force Materiel Command is the major command charged with the research, design, development, procurement, testing and support of Air Force weapon systems.

The command operates product centers, air logistic centers, test centers, lab facilities and a number of smaller direct reporting units located all over the continental United States.

The headquarters AFMC Directorate of Intelligence, located at Wright-Patterson Air Force Base, Ohio, guides intelligence offices within the command. Those offices, which are headed by directors of intelligence, or DIs, are tailored to support the unique intelligence needs at each location.

Job of a DI

Where is trouble brewing and will we have to fight? Will we need to increase the deployment of specific types of weapon systems? Do our systems need modifications to eliminate vulnerabilities? Are there any threats to the personnel or infrastructure of a base?

"These are key issues that DIs must address every day," said

Mr. Alex Drinkwater, AFMC intelligence officer.

"The director of intelligence is the single point of contact with the intelligence community for the program and project offices regardless of classification. The director is responsible for all security aspects of intelligence."

The basic responsibilities of a DI is providing consultation concerning what intelligence services and products are available, establishing intelligence requirements for unique support, providing intelligence products, approving release of intelligence data for AFMC contractor use, and coordinating security-classification guides.

"The directors of intelligence support integrated weapon system management at the different centers according to where they sit in the integrated weapons development process," said Mr. Drinkwater.

AFRL

AFRL personnel work at the cutting edge of technologies trying to find new ways to advance Air Force systems and

improve mission capabilities.

"In the laboratory, new technologies are being developed and the more promising ones sometimes become programs," said Mr. Matt Anderson, AFRL intelligence officer. "We are primarily concerned with foreign technologies and foreign research and development."

As the laboratory is often the place where a new technology will see the light of day, intelligence support is vital to this work.

"For example, engineers at Armstrong Lab engaged in developing visors for flight helmets are concerned with a potential enemy's ability to blind a pilot with a laser," said Mr. Anderson.

"Similarly, personnel at Phillips Lab working on the airborne laser need to know the physical characteristics of foreign missile systems in order to intercept and destroy them."

Since lab projects often turn into new systems, or improvements to existing systems, an early infusion of accurate, timely intelligence is crucial to their work. To support such efforts, AFRL intelligence officers provide assessments of current and future foreign military capabilities, state-of-the-art foreign technologies, and trends in foreign military acquisition.

Product centers

AFMC product centers are the places where ideas for new systems become reality.

Here is where intelligence plays a significant role in making major decisions on system design.

For example, to make sure the F-22 is designed for combat superiority, the system program office needs information on foreign aircraft an F-22 pilot may come up against, anti-aircraft artillery, surface-to-air missiles, radars and jamming devices, as well as doctrine and tactics of potential enemies.

"We use threat data to make decisions on crucial issues such as survivability," said Lt. Col. Andy Pickens, Aeronautical Systems Center, office of intelligence.

"We have to decide, as an example, how much to invest in defensive systems depending on the nature of a potential threat. Obviously, the most up-to-date and accurate information is necessary."

Systems are actually developed at the product centers and the program office stays here until the system becomes operational. This is where the bulk of intelligence support to acquisition is done and where most of the intelligence require-

ments are written and submitted.

Test centers

Before the system becomes operational, it is tested. The DIs at Edwards AFB, Calif., Arnold AFB, Tenn., and Eglin AFB, Fla., support the test phase with modeling and simulation. The use of threat models is important here.

"At this stage of the game, testers have to decide whether the systems are capable of handling potential threats from enemy systems," said Mr. Elton McDill, Arnold Director of Intelligence. "This is done, in many cases, through the use of computerized models of foreign systems."

The higher the fidelity of the threat model, the higher the applicability of the testing. DIs at each test center work closely with the testing organizations and contractors to ensure the most current and accurate data are used to develop models.

"Doing so helps test new weapon systems in a day which resembles real-world conditions," said Mr. McDill.

Air logistics centers

After systems are operational, they are maintained at air logistics centers. The DIs are concerned with foreign developments that may affect systems after they are operational — changes in the threat, modifications to enemy threat systems, etc. Such work may actually facilitate a major modification to a system. Or, vice

versa, a major modification can trigger a whole new look at the threat in support of the modification.

"The infusion of timely intelligence into the latter phases of integrated weapon system management is taking on a new importance," said Mr. Rick Bolin, Ogden Air Logistic Center, Utah, senior intelligence officer. "Today's political and economic realities mean fewer new starts for weapon systems and longer lifetimes for existing ones."

There will be more modifications of older systems with new technologies in order to extend their lifetimes, necessitating a constant evaluation of threat data as well as keeping tabs on foreign technology developments, he said.

— Reported by Mr. Alex Drinkwater and Maj. D.B. Posey, AFMC Office of Intelligence; Lt. Col. Andy Pickens, ASC Office of Intelligence; Lt. Col. Dean Sharp, AAC Intelligence Directorate; Capt. Ronald Buchsen, AFFTC Intelligence Operations; and Mr. Pierre Ghazal, ESC Office of Intelligence



Mr. Francis Ho, a B-52 Mission Planning Electronic Engineer at Tinker Air Force Base, Okla., tests Mission Planning System software before its release for use in the field. Tinker's Intelligence personnel provide maps and other digital aeronautical flight information that indicates hazards, high elevations and other critical information. (Photo by Ms. Margo Wright, OC-ALC)

Intelligence team meets to develop new strategy

The end of the Cold war and subsequent drawdown of personnel took its toll on intelligence. Intelligence support to acquisition had fallen behind for many reasons including the disparity of intelligence organizations between two commands, Air Force Systems Command and Air Force Logistics Command.

"You need a new strategy for intelligence support to acquisition," said Maj. Gen. Glen Shaffer, Air Force Director of Intelligence, Surveillance and Reconnaissance.

These words began a process involving the labors of dozens of people and many months of planning to develop a strategy for integrating intelligence support into integrated weapons system management.

A team, with members from AFMC Intelligence, the 497th Intelligence Group, and other members of the Air Force intelligence community, along with Gen. Shaffer, met in Washington, D.C., to lay out all the requirements and associated functions performed by intelligence in acquisition support.

"We needed a radical departure from 'business as usual,'" said Gen. Shaffer. "What evolved was a strategy that calls for support to programs and projects throughout their lifecycle; ensuring the intelligence production community has the information to support all requirements; ensuring the tools are there for people to do their jobs; and making sure people know the reason for intelligence support and how to use it."

The mission of the intelligence

organizations of AFMC and the rest of the acquisition community is not "sexy" or filled with intrigue like the popular image of intelligence work.

For the most part, intelligence directors need to be capable of "selling" their wares to program offices that are often not aware of how the intelligence office's capabilities can help program development. The director also has to serve as a negotiator to make sure the intelligence community lives up to program expectations.

Intelligence support to force modernization may not be a glamorous job, but it's a vital part of the efforts that go into making USAF weapon systems the best in the world.

— Mr. Alex Drinkwater, AFMC Intelligence office

Training is just a mouse-click-away



Air Force Materiel Command's Directorate of Intelligence will soon release an innovative distance learning program rivaling those of the most sophisticated internet-based universities.

Designed to teach how intelligence supports and influences force modernization processes, the distance learning program spans the gamut of functions — from planning and weapon system acquisition to architectures and systems.

The course grew out of a need to provide training to intelligence professionals across the broad range of force modernization areas.

Under the previous structure, intelligence and acquisition personnel received limited training linking specific force modernization requirements to intelligence.

With the distance learning format, intelligence and acquisition professionals will be able to access the latest course offerings on demand.

Ms. Kristin Scherer, AFMC training manager for the Intelligence Resources Division, runs the development program, leading an education and training team in the effort to design a complete course.

"This course is a leap forward for the acquisition and intelligence communities," she said. "For the first time ever,

the ties between intelligence and force modernization will be explained to the broad intelligence and acquisition work force."

The entire development effort has been coordinated and brought to the implementation stage via video teleconferences and e-mail, a reflection of the technology incorporated into the course itself.

Course content is fully controlled and maintained by the command through close coordination between subject matter experts throughout the Air Force with the technical writers at Brooks Air Force Base, Texas.

This web accessible training program allows course participation to be tracked and documented. The first prototype will hit the streets in April 2001. Classes are officially scheduled to begin October 2001.

The force modernization distance learning program enables AFMC to offer a complete course of study specifically designed to meet current and future needs of its intelligence professionals.

"It represents a leap into the future of training technology that will aid acquisition and sustainment well into the 21st Century," said Ms. Scherer.

— Maj. D.B. Posey, USAF Reserve

Keeping Gen. Lyles, AFMC staff informed

Intel helps AFMC leaders make tough decisions



First Lt. Elizabeth Jara briefs intelligence issues to Gen. Lyles and his staff twice a week.

The day begins early for the command support branch of AFMC Intelligence, or INAC. By 6 a.m., Intelligence lieutenants like 2nd Lt. Tyrone West begin preparation of the daily intelligence package which is distributed to Gen. Lester Lyles and Lt. Gen. Charles Coolidge every morning.

Commander's watchdog

Culling pertinent data from a multitude of national sources, INAC provides a digest of focused intelligence to keep the senior staff informed of any potential trouble spot. Unlike most major commands in the Air Force, AFMC must support the warfighter whether the theater is Sub-Saharan Africa, the deserts of Southwest Asia, or the war-torn Balkans. Being the watchdog for the commander has its challenges.

"Intelligence cannot focus on any one region, it's essential to monitor the entire world for changes which might impact AFMC," said Lt. West. "We have to know what capabilities are out there so the warfighter can counter any threats."

The most visible activity of the INAC is the bi-weekly intelligence update presented to the AFMC commander as a part of his scheduled staff meetings. The process begins when intelligence personnel select topics dealing with science and technology that might be of interest to the senior staff.

However, the simple reporting of facts is only a part of an intelligence professional's job. Quality analysis to determine a potential adversary's future weapon developments and modes of employment is the other half of the equation. Providing the "so what" or "bottom line" to the commander is really the key to current intelligence.

Watchdog prowls the streets

INAC contributed to the command's effort during Operation Allied Force. During the operation, headquarters intelligence personnel diligently monitored the latest Serbian and international developments and kept the commander and staff apprised of events by a series of focused briefings. They also became key players in the target-development effort at

EUCOM headquarters in Stuttgart, Germany, and the battle damage assessment imagery process in Vicenza, Italy.

The rest of the pack

The process of keeping the commander informed is made easier through Intelink, the intelligence community's version of the Internet. INAC personnel have almost instantaneous communication with analysts worldwide.

"AFMC's scope is broad and that means we have to have people throughout the world to keep the level of intelligence we need," said Maj. M. C. Dereshkevich, branch chief. "Unfortunately, we don't have the manpower to do that, so we need to rely on experts who are region specific. This helps us present a consistent intelligence perspective to the leadership."

Fortunately, much of the analytical expertise the command support branch relies upon is just a few buildings away, at the National Air Intelligence Center, or NAIC. The information NAIC provides to INAC contributes immeasurably to the success of the briefing program.

INAC supports not only the commander, but also other organizations within the headquarters. The branch represents the intelligence directorate in such forums as the force protection working group and the defensive counter-information working group.

Protecting important masters

"AFMC is important because it develops weapon systems to support the warfighter and deters foreign aggression," said Mr. Steve Hoberty, command support branch engineer. "Intelligence is essential to AFMC because we must know the threats out there, in order to develop systems capable of countering those threats."

From support to the commander, to ensuring the latest information gets to a working group, to managing the Foreign Materiel Program, INAC personnel are keenly aware that "it all begins with intel."

— 1st Lt. Elizabeth Jara, AFMC Intelligence

Cloaked in secrecy, Intel has the information to make weapon systems the world's best



A shroud of secrecy has covered the MiG-29 behind the Iron Curtain, but no more. The United States government signed an agreement with the Republic of Moldova, formerly part of the Soviet Union, to purchase 21 MiG-29 fighter aircraft in 1997.

A team of intelligence experts carefully tested the aircraft then supervised transportation of the disassembled fighters to the National Air Intelligence Center, or NAIC, at Wright-Patterson Air Force Base, Ohio. Upon arrival at NAIC, experts in foreign material exploitation began the highly complex task of studying the aircraft's capabilities and limitations.

"The results of efforts like these are written into intelligence studies that are then used to determine the nature of the threat to our systems in development," said Mr. Alex Drinkwater, AFMC Intelligence officer. "This eliminates building it in a vacuum where you don't know the capabilities of the threat."

When a new plane rolls out of the hangar, there are many things that went into it that are unseen. Foremost among these is the work of the dedicated men and women in the intelligence centers who spend countless hours looking for the proverbial "needle in a haystack," that one piece of information that provides the "clue" to the mysteries of potential enemy capabilities and intentions.

"Without this painstaking, behind-the-scenes work, that shiny new airplane would be little more than another lucrative target," he said.

Information suppliers

The intelligence production centers are the suppliers of this information. The Air Force's National Air Intelligence Center, Army's National Ground Intelligence Center, the Defense Air Intelligence Agency's Missile and Space Intelligence Center, and Navy's Office of Naval Intelligence are national "centers of excellence" providing expert analysis on foreign military capabilities.

The Defense Intelligence Agency is the entity which "referees" the intelligence efforts of the centers through a system known as the Department of Defense Intelligence Production Program. This special computer system is setup to input, review, validate and transmit intelligence production

requirements.

The use of specialized computer systems affords intelligence analysts a variety of tools. These tools aid in protecting intelligence sources while "ensuring the other side does not know what we know," said Mr. Drinkwater. Therefore, intelligence capabilities of some weapon systems are deliberately hazy to the general public.

"In general, a 'typical' intelligence analyst uses information from a variety of sources to include electronic, human sources and imagery to dissect and test actual foreign hardware," said Mr. Drinkwater.

Information secrets

There are successes within these agencies, like the MiG purchase, that unfortunately can't be discussed. Relating examples of intelligence successes has always been a difficult proposition due to the classified nature of the business.

Often, the only specifics that could be publicized were quite old, for example, the exploitation of early Soviet MiG aircraft during the Korean War which led directly to improvements in the use of the F-86 Sabre Jet and, consequently, more aerial victories for American pilots.

"It should be clear that it would be an enormous waste of resources, not to mention the dangers involved, to design a system without taking into account the nature of the opposition," he said.

— Ms. Estella Holmes, AFMC Public Affairs

Maps advance to fit warfighter needs

In an era where information dominance is as important as air superiority, system developers are continually seeking better ways to present information to users. This type of information has traditionally been displayed by using a map. Now, as technology and requirements have evolved, so has the need for “smarter” maps.

This leads into the realm of Geospatial Information and Services, or GI&S, a facet of intelligence support to force modernization. Geospatial information is exactly what it sounds like, digital information about geographic points on earth in space — in other words, a smarter map.

Importance of geospatial data

“Over the past 25 years, the National Imagery and Mapping Agency, or NIMA, has pioneered development of geospatial information with development of more complex weapon systems using digital map information,” said Mr. Wesley Carter, AFMC GI&S officer.

Why is geospatial data important and how does it relate to these programs? “To answer these questions, we need to look at some basic facts about the evolution from hard copy maps to digital mapping environment,” said Mr. Carter.

“From the days of the earliest travelers, man has depended on the application of ink to record and repeat his movements. Because human development was fairly stable, maps proved adequate as navigational sources for hundreds of years.”

Decline in usefulness

However, as technology develops, the map has seen its usefulness decline. Rapid changes, such as new roads or large-scale development, quickly make today’s printed maps out of date. In contrast, the development of digital maps, easily displayed with computer software, has revolutionized the way information is exploited about the earth’s surface.

“In today’s digital maps, changes can easily be added and removed, multiple overlays created and they can be printed with original data remaining intact,” said Mr. Carter. “Data-bases related to geographic data can be attributed to the digital map, thereby providing additional information with one mouse click.”

In the late 1970’s Air Force systems used NIMA digital

geospatial data. Subsequent developments and uses have paralleled the rapidly growing and increasingly sophisticated computer industry.

“Early geospatial data supported visual and sensor simulation for the B-52, F-16 and other weapon system trainers and in-flight navigation data for cruise missiles,” said Mr. Carter.

Starting in the mid-1980s, as computers became more powerful and processing speeds increased, geospatial information expanded from the simulator and cruise missile world into other functional areas such as mission planning.

Need for better, more accurate maps

As computers are becoming more powerful, today’s Air Force systems are increasingly designed to exploit higher accuracy information.

“Customers want to fly faster, target more accurately and rapidly, fly closer to the ground and even experiment with non-conventional means of navigation, such as gravity displacements,” said Mr. Carter. “While some Air Force systems are capable of working with existing geospatial data, others have more demanding needs.”

Developments in digital geospatial technology are increasing dramatically every day. NIMA is proposing new concepts to support advanced applications, while considering older products for phaseout. Proposed government and commercial collection systems promise an increase in the quality, accuracy and timeliness of geospatial information.

“NIMA’s collection of geospatial information products supports vital Department of Defense activities and systems,” said Mr. Carter. “In addition, NIMA occasionally develops and distributes prototypes to test and gauge user interest in new information technologies.”

“In AFMC, intelligence support organizations at each base are chartered to serve the geospatial information needs of the system developer, not only for existing products, but also for advice and support.”

“For those developers who are considering using these products, we offer this singular advice: talk to your local intelligence support organization early and often. Communication is the key to preventing information related problems in your program.”

— Mr. Alex Drinkwater, AFMC Office of Intelligence



Intel provides the "right stuff"

The F-22 pilot jinked, desperately trying to shake the MiG behind him. He executed a series of maneuvers thought incapable for a MiG, wondering how the other aircraft was able to stay with him. The pilot tries to get away before the other guy is able to get target lock-on. Yet the MiG follows in his wake just a breath away.

Suddenly, his wingman appears out of nowhere and takes up position behind the MiG, causing the Russian-made craft to break off the engagement. The lead pilot radios his thanks for the rescue and the two head for home.

On the way, the pilot again wonders why he didn't know the foreign aircraft had that kind of capability.

The above is fiction but something like this could happen in the not-too-distant future if the "right stuff" isn't taken care of today. In this case, the "right stuff" is the threat information and other intelligence support needed to design an Air Force weapon system. There are many decisions made during the design, development, testing and support of a system.

Among the many factors that go into such decisions is a reasonable estimate of what the foreign threat will be like when the system becomes operational. That daunting task is the job of the men and women of the intelligence "community" within AFMC. Headquartered at Wright Patterson Air Force Base, Ohio, the community oversees a network of intelligence directors, or DI, each of which supports a product center, test center, air logistics center or lab research site.

These folks are the intelligence community's representatives at their respective locations, providing the various program and project offices with a variety of intelligence services. Typical of a product center DI is Lt. Col. Chuck Mustapich at Electronic Systems Center, Hanscom Air Force Base, Mass.

"We support a myriad of programs, each of which requires a different 'suite' of intelligence support. Our intelligence integration officers are key members of the program office teams whose mission is to ensure timely, tailored intelligence is provided for system design decisions and program milestones.

"The goal is to assist the developers of command and control systems to deliver products that can operate effectively

in future threat environments," he said.

Each DI office is manned by people trained to help determine what the potential threat is to the particular program. For example, in developing a space system, the project office needs to know threats from anti-satellite systems, electronic warfare and exotic systems which may be deployed against them.

Armed with that information, they prepare intelligence production requirements which are essentially questions about the nature of foreign weapons and other systems.

These are sent to appropriate intelligence production centers, such as the Air Force's National Air Intelligence Center, the Army's National Ground Intelligence Center, Defense Intelligence Agency's Missile and Space Intelligence Center, and occasionally Navy's Office of Naval Intelligence. Once the product is finished, it is transmitted back to the customer who uses the information to help design the system. A typical report might deal with foreign missile characteristics, aircraft performance parameters, or space system specifications.

Obviously, intelligence analysts have a difficult job — predicting the future is no easy task. More than one intelligence analyst has been heard wishing for a "crystal ball." But without the work of the dedicated professionals of the intelligence community, an Air Force pilot of the future could very well find that "bogey" on his tail and wonder how it got there.

— Mr. Alex Drinkwater, AFMC Intelligence



The A-10s, F-15, and F-117 to the right are all examples of systems that need information intelligence to become the most capable aircraft. This information is what keeps the United States a technology leader.
(A-10 photo by Senior Airman Greg Davis, F-15 photo by Airman 1st Class James Harper Jr., F-117 photo by Tech. Sgt. James Mossman.)



Developing Air Force intelligence technology

For nearly a half-century, scientists and engineers at the Air Force Research Laboratory facility at Rome, N.Y., have put the "I" in C4I, or Command, Control, Communications, Computers and Intelligence, for the Air Force and other Department of Defense agencies.

Today, that responsibility falls upon the Air Force Research Laboratory Information Directorate, or AFRL, Information and Intelligence Exploitation Division.

The division's mission is to conduct research and development to implement global awareness and support precision engagement and full dimensional aerospace protection by advancing state-of-the-art intelligence surveillance and reconnaissance exploitation capabilities.

Battlestaff support

Technologies developed by Air Force researchers and teams of contractors from around the nation support collection, processing, storage, fusion and dissemination of both real-time and stored information in support of all battlespace participants.

The division partners with the Automatic Target Recognition Technol-

ogy Division, AFRL Sensors Directorate, and relies on them to develop the sensor automatic target recognition technology to detect, track and identify targets for inputs into the global awareness picture.

In addition to research and development, the division also conducts selected acquisition programs for low-volume, limited-quantity systems for the intelligence community.

Developing technologies

The division's fusion technology branch identifies and develops technologies so that real-time and stored data are fused to support global awareness.

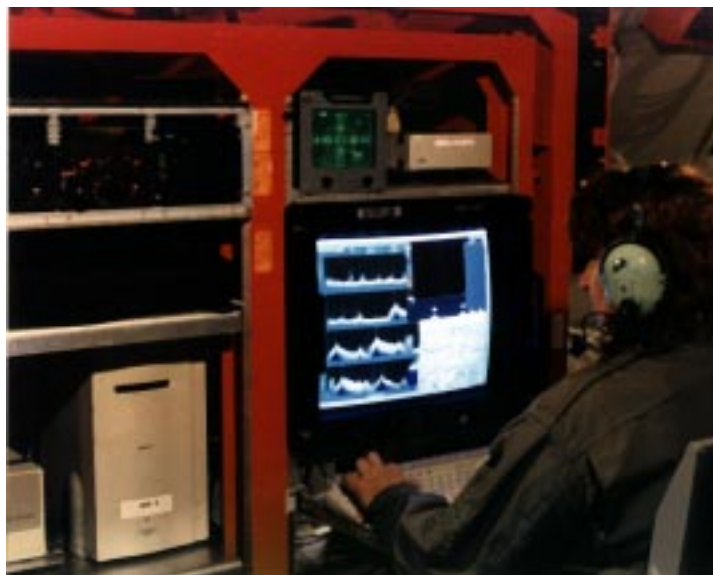
Research is conducted to integrate technologies to provide a common operating picture to dynamic planning and to data warehouse functions while providing feedback to the data collection operation improving the quality of targeting.

Advanced technologies

In the information handling branch, personnel identify, develop, prototype, transition and support advanced technologies and approaches for acquisition, analysis and timely dissemination of intelligence information to the intelligence community.

These techniques acquire and assimilate-disseminate intelligence products needed by decision makers to ensure that battlespace dominance is maintained.

Personnel in the multi-sensor exploitation branch advance state-of-the-art, multi-sensor imagery and signals



Ms. Emily Krzysiak, Air Force Research Laboratory Information Directorate, Information and Intelligence Exploitation Division, operates "Ice Ax," a radio frequency interference cancellation system that she developed.

intelligence exploitation technologies.

These advancements are cost-effectively transitioned to Air Force, DOD and National Command, Control, Communications and Intelligence (C3I) systems ensuring sustainment of an information-dominant fighting force.

Information management

Finally, the global information base branch is responsible for conducting research in information management, storage and retrieval, and providing a full suite of access services for "on-time" C4I information to the warfighter.

Techniques for comprehensive knowledge of the battlespace is developed so that all warfighters, from the theater commander to each individual combatant, has information to support their decisions and actions.

Diverse facilities

The information and intelligence exploitation division houses several diverse facilities to support development of automated equipment and techniques that gather, translate and condense massive amounts of intelligence data for military purposes.

These facilities allow division personnel to address the processing of image features, speech data, textual information, digital imagery, electronic signal information and cartographic data.

— Mr. Francis L. Crumb, AFRL Public Affairs

Keeping secrets secure: Operations in the Special Security Office

If you're a fan of James Bond, you're usually eager for the release of each new movie. The action, the new "toys" and gadgets, the suspense and intrigue, the emergence and triumph of good over evil, are all the trappings of a good flick that entertains the moviegoer. But, who supports Commander Bond before he heads out on a mission? None other than the "Q" Directorate, headed by the infamous "Q" himself. James Bond would never attempt a mission for her Majesty unless provided the means and the tools by "Q".

Such is the support mission of the Special Security Office, better known as "the SSO." Although not involved with the development of hi-tech gadgets, this support function is a vital one serving AFMC in a variety of ways. AFMC has several such offices throughout the United States, all of which report to the Sensitive Compartmented Information, or SCI, security policy office at Wright Patterson Air Force Base, Ohio.

Closely guarded

"SCI comprises much of the country's most closely guarded secrets," said Mr. Tim Schneider, physical security specialist. "Thus the need for the cloak of secrecy surrounding the SSO mission." This mission includes the protection of information and assets. Although not as glamorous as those operations depicted in a typical James Bond movie, this security management function is the conduit that enables information sharing, intelligence dissemination and mission achievement.

"Each link of the security chain is important, since a breakdown could result in the compromise of extremely sensitive information or national assets," he said. "The SCI security program provides the foundation for managing this highly sensitive information."

"We're responsible for more than 125 Sensitive Compartmented Facilities over 20,000 military, civilian and defense contractor SCI billets, and more than 125 sites with electronic processing of classified materials," said Ms. Pam Esken, the security management division chief. "That's a lot of assets and involves quite a few business actions that must be accomplished every day. If not, field units feel the impact and their mission may suffer. Especially if someone has an emergency that requires timely action on our part."

Gaining access and use of SCI means lucrative contracts for the defense industry – now more than ever.

AFMC has a significant number of contractors engaged in SCI operations. More so than all the other major commands within the Air Force. That means AFMC SSO professionals must be versed in the language of contract security classification specification.

Contractor support

"The function of the SSO is especially valuable for the defense industry," said Mr. Schneider. "Once a contractor is awarded a government contract, it's important for the contractor to begin working immediately.

"If not, cost and mission impacts toward contract execution

may occur – a result neither the military nor the contractor wants."

The SSO then assists contractors to ensure compliance with security regulations, while maintaining milestone schedules and timely execution of their contract, he said.

The AFMC SSOs and their contractor counterparts, the Contractor Special Security Offices, or CSSOs, have a long tradition of working together to ensure the successful security of intelligence programs as they are carried out on various platforms. The SCI security management of these programs ensures the mission succeeds without compromising its purpose and focus.

"If that information is divulged, intentionally or not, it allows the target to take measures to protect themselves or try to deceive us," said Mr. Schneider. "Neither of which is acceptable in the intelligence business."

The SSO – the link for combating espionage

"Comprehensive education of the SSO cadre of security professionals enables the Air Force to maintain better security of SCI, while reducing security violations and successfully monitoring indicators of espionage," said Mr. Schneider. "The best method of protecting SCI is through a security program that accounts for all facets of information protection."

The money spent on fortifying an area with all kinds of security locks, alarms and construction is worthless if a good security program is missing. The most important element is the people who implement and practice proper security.

"Security is not a spectator sport, it requires a full team effort by all staff working in the office," said Mr. Schneider.

Breakdowns in a security program are evident today, as seen with the problems within the State Department and the Department of Energy. Significant security lapses have occurred, with the alleged result of missing laptop computers, document files, hard drives and possible commission of espionage. Bad things happen when proper security management hasn't been implemented and constantly exercised.

The mission setting

The AFMC SSOs and CSSOs support a variety of missions and assets. Some of the more commonly recognized ones include the U-2, RC-135 (Rivet Joint), and EC-130 series (Rivet Fire, Compass Call).

Although there have been some astounding successes with these different programs, it's simply impossible to tell those stories. That's why you don't hear very much about the SSOs and CSSOs; their mission is to protect the nation's secrets and perform their work behind the scenes.

Most people will never see the critical support functions performed by the AFMC SSOs for their military units and defense contractor clients. That is the goal of the SSO professionals: remain invisible to the outside world, while providing the infrastructure of support to AFMC intelligence specialists – and keeping the secrets of the nation secure.

— Reported by AFMC Intelligence office

IMAs support intelligence forces

Having long ago shed the moniker of “weekend warriors,” most AFMC Individual Mobilization Augmentees, or IMAs, work alongside their active duty counterparts on a day-to-day basis, filling long-term overseas deployment requirements, conducting counterdrug tours or supporting exercises and real world contingencies.

“Our goal in the intelligence IMA program is to seamlessly blend critically needed reserve assets into the total Air Force mission,” said Col. Jim Myers, director of intelligence.

There are 29 intel IMAs assigned to AFMC who, despite full time civilian careers, perform many demanding functions.

People like Staff Sgt. Walt Wolfkill, who stepped in to fill a critical gap in manpower by performing multiple 179-day tours, exemplify the role IMAs play in AFMC.

For fiscal year 2000, intel IMAs provided what combined to over six and one-half years of added support.

Following are just a few of the many innovative ways IMAs supported the intelligence program.

A new way of communicating

Telecommuting is a relative newcomer to the Air Force way of doing business, but it pays many dividends in this digital age.

Chronically strapped for intelligence resources, the telecommuting program allowed an IMA to replace an active duty member who had moved on.

Operating from her home base in Columbus, Ohio, Maj. Jennifer Triplett has a 1-800 line, a remote access account to tie into the Wright-Patterson computer network, a fax machine and all the other technological tools to enable her to remotely manage AFMC intelligence IMA activities.

She manages the day-to-day administration of the AFMC IMA force by interfacing with Air Intelligence Agency and the Air Reserve Personnel Center to coordinate active duty and special tours, travel orders, awards and a host of other personnel issues.

Maj. Triplett is physically present at headquarters several times a month. The remainder of management is accomplished via telecommuting.

Deployments

Lt. Col. Mary Burgher, based at Tinker AFB, Okla., served a two-month tour in Operation Northern Watch in support of the Airborne Warning and Control System, or AWACS.

Her many duties included briefing aircrews on a regular basis on Iraqi missile and aircraft threats. Col. Burgher

provided daily combat search and rescue information to crews supporting real-world aircraft emergencies.

Operational readiness

When the command re-initiated Operational Readiness Inspections in 1996, the IMA intel community was first in line to support the demanding deployment schedule. The headquarters inspector general’s office is supported by an IMA who writes the scenarios, integrates inspector inputs into intelligence messages and evaluates each unit’s overall wartime-mission performance.

At Ogden Air Logistics Center, Hill AFB, Utah, Maj. Diane Thornley researches worldwide events to detail key technology activities for directors.

She also prepares theater-specific pre-deployment briefings for Ogden units and develops threat scenarios for operational readiness exercises.

Participation in exercises

At the Strategic Missile Center, Los Angeles AFB, Calif., Lt. Col. Paul Geiger organized reservists into a group of evaluators in this year’s Joint Expeditionary Force Exercise.

The reservists tracked the performance of systems, evaluated their effectiveness and authored assessments detailing potential mission contributions.

At Electronic Security Command, Hanscom AFB, Mass., intel IMAs recently exercised in Operation Island Guard, challenging Department of Defense reserve assets to collectively resolve support requirements inherent in U.S. led coalition operations under a joint task force structure.

IMA support unlimited

“We cannot operate without IMA support,” said Ms. Bonnie Grey, Robins Air Logistics Center, Ga., director of intelligence. “They are the corporate knowledge in this organization, and provide us a continuum of support we couldn’t buy at any price.”

There are many other ways IMAs support intelligence, with the end result being that IMAs provide a vital force multiplier for the active duty that costs relatively little to maintain, yet adds magnitudes to the capability of the total force.

These mortgage brokers, scientists, realtors, authors and scores of others are the embodiment of the citizen-soldier, working together with active duty and Air National Guard to make the Air Force mission of global engagement a reality.

— Lt. Col. Gail Schikora, AFMC Intelligence Reserve Chief



Lt. Col. Mary Burgher, an individual mobilization augmentee for Tinker Air Force Base, Okla., Intelligence office, briefs current air and ground threats to AWACS crew members, from left, Staff Sgt. John White, Senior Airman Gabe Richardson, and Tech. Sgt. Mike Simmons.

News Briefs

AFRL studying automatic voice processing for prison applications

ROME, N.Y. — “Stone walls do not a prison make ...” Mr. Richard Lovelace wrote. And the 17th-century English poet never even saw a pay phone on the wall of a cellblock.

Researchers for the Air Force Research Laboratory Information Directorate, along with a team of contractors, have successfully completed a study for the National Institute of Justice and the Bureau of Prisons to develop a plan that applies advanced voice processing technology to reducing inmate telephone criminal activity.

The study developed methods to reduce inmate crimes such as harassment, drug solicitation and credit card fraud using existing automatic voice processing technology.

The technology has the potential to save hundreds of millions of dollars in telephone monitoring costs over the current systems being used.

“This was primarily a study looking at existing technology and new applications of that technology,” said Dr. Stanley J. Wenndt, research engineer in the directorate’s information and

intelligence exploitation division.

“Some areas identified included speaker verification to ensure the right inmate is using the right personal identification number,” said Dr. Wenndt.

Additional voice processing technology that can be applied to monitoring prison communications includes “whisper detection,” since whispered speech is an indicator of possible illicit activity.

Existing technology can also automatically detect the use of long lists of digits on a phone, indicating a prisoner is using credits cards for some purpose.

— *Reported by AFRL Public Affairs*

Complex changes hands; telescope becomes operational

MAUI, Hawaii — The Defense Department’s most sophisticated telescope complex changed hands Oct. 1.

In conjunction with the changeover, Air Force officials announced that the complex’s 3.67-meter telescope — the world’s largest for taking pictures of

passing satellites — was now fully operational.

The Maui Space Surveillance Complex is used primarily to track and image satellites and for research into technologies and techniques for improving the quality of the “pictures” that are taken. “Ownership” of the complex atop Mt. Haleakala has now passed from Air Force Space Command to Air Force Materiel Command, reflecting a greater emphasis on the site’s research activities, closer collaborations with academic researchers, and developing and implementing techniques that will further improve the quality of images collected.

A majority of the operations atop the mountain, along with four individuals, have now transferred to Detachment 15 of the Air Force Research Laboratory’s Directed Energy Directorate.

The laboratory’s Directed Energy Directorate also manages a \$40 million supercomputer system known as the Maui High Performance Computing Center on the island. Overall, there are 15 military and government civilian employees and more than 200 contractor employees. The directorate oversees seven contracts valued at \$225 million.

— *AFRL Public Affairs report*

SSG adds network risk assessment to service portfolio

The Air Force Communications Agency has licensed Standard Systems Group Communications Environment Test Lab, located at Maxwell Air Force Base, Ala., to provide network risk assessments for automated information systems intending to use Air Force networks.

SSG designed the risk assessment to emulate a network control center environment using standard Air Force communications infrastructure management hardware and software.

The lab was authorized by Dr. Lawrence Delaney, assistant secretary of the Air Force for acquisition and chief information officer, to perform network risk assessments as part of the certificate process.

The assessments include analyzing systems impact on the network, interoperability with infrastructure and network security.

Security tests focus on password security, logins, impact on network bandwidth and compatibility with communication and information infrastructure.

Test results, along with system certification and accreditation packages, provide commands the documentation necessary to load systems on the base level infrastructure.

“Licensing SSG to perform this work further seals the partnering relationship between SSG and the rest of the Air



Test lab technician Senior Airman Barry Franklin ensures local area network connectivity for Standard Systems Group, Maxwell Air Force Base, Ala., software factory testers. (Air Force photo by Mr. Bud Hancock.)

Force to improve networkiness,” said Mr. Robert Frye, SSG executive director.

The SSG test lab joins the Air Force Network Test Center at Scott AFB, Ill., as one of the only facilities licensed to test for certificate of networkiness.

— *Information supplied by SMSgt Sue Garland, SSG*

Shop can't beat low-tech solution

Despite the high technology nature of the Air Force mission, one shop at Tinker Air Force Base, Okla., can't beat a low-tech solution to finding problems.

The "tap test" is a tried and true test for finding damaged spots on bonded structures the composite manufacturing and repair unit overhauls. Using a blunt metal object called a tapper and a good ear, a technician performs this test to "hear" damage not visually apparent in the structure.

"After the technician draws grid lines across the larger structures to reduce the working area to manageable size, they tap inside the grid areas in a cross-hatch pattern listening for tonal changes," said Mr. Stewart Williams, unit chief. "When you come across a dead area, you hear the change. A dead spot is where the fiberglass or honeycomb is damaged."

The 86 members of the unit work two shifts to ensure an uninterrupted supply of bonded structures for the Air Force. Bonded structures are made from many different composite materials such as fiberglass, graphite, boron and polyquartz to name a few, or a combination of these materials.



Their overall mission is to overhaul and repair radomes for the B-52, KC-135 and E-3, as well as structural work on other composite parts such as B-1B horizontal stabilizers, B-52 sheet metal panels, B-52 reverser rings, B-52 wing tips, B-1B wing glow radomes, aircraft floorboards and B-1B weapons bay doors just to name a few.

"Even the E-3 rotor dome and the weapons bay doors for the B-1B are repaired here," he said. "Many people don't know that the weapons bay doors are made from a combination of fiberglass, graphite and Kevlar, which makes them much stronger."

When the shop was first established, the repair and overhaul of radomes was the biggest part of the workload. A radome is basically a shell covering radar antennas on the aircraft. These often receive damage in flight from bird strikes and hail storms and other weather conditions.

"They're made out of a combination of fiberglass and honeycomb to be lightweight and allow the radar signal to pass through," said Mr. Williams. "At the same time, this makes them susceptible to damage."

In addition to the tap test, the shop uses many types of equipment with the latest technology. The AUSS V, for instance, uses sound waves transmitted through water to detect decibel changes between transmitter and receiver, which indicates possible damage. This test is similar to that of a sonogram.

The unit has what looks like a huge cave called the autoclave. "The autoclave is a curing oven that works like a giant pressure cooker," he said. "It cures parts through computer-controlled heat, pressure and vacuum cycles. This makes the part stronger by compressing the multiple layers of composite skins and removing excess resin and air."

If damage is extensive, the radome is sectioned off and work is performed section by section. "One section can cure while they're working on another," he said. "We average about five B-52 nose radomes and about 12 to 15 KC-135 nose radomes a month."

After the unit has overhauled the radomes, they are sent to the testing facility and checked to ensure that the radar signal can still be transmitted and received through the repair work. "We have very few that don't pass the test, but if that happens, the radome is returned to the shop and we repair the area with the substandard radar signal," said Mr. Williams.

— Reported by Ms. Gail Kulhavy, OC-ALC Public Affairs

A tube-shaped autoclave combines heat, pressure and vacuum to compress the adhesive of a repair, forming a better bond. Mr. Ralf Castleman, work leader, and Mr. Tony Bangart, autoclave operator, connect lines that will monitor progress during the all-day procedure. (Photo by Ms. Margo Wright, OC-ALC Public Affairs)





Staff Sgt. Ken Dockery of the 653rd Combat Support Squadron uses the computerized wiring maintenance aid to troubleshoot an F-15 equipment bay during a recent exercise at Robins Air Force Base, Ga. The system was developed to give the technician access to a computerized database of the entire aircraft wiring system. It cut their damage assessment time in half.

Exercise at Robins tests new maintenance aid

A crackle comes over the radio, "Code 5, battle damage left wing."

The pilot struggles to get his crippled F-15 aircraft on the ground safely. The pilot's skill and training are tested to the limit as he slowly touches down and comes to a halt amid flashing lights and sirens. But, among the emergency rescue teams are doctors ready to work on the plane, not the crew.

This scene was a part of a recent exercise held at Robins Air Force Base, Ga., where members of the 653rd Combat Logistics Support Squadron "aircraft doctors" tested their battle damage repair capabilities.

Using a C-4 charge, the CLSS was able to simulate combat battle damage on an F-15, which the unit uses only for exercise purposes. In this specific exercise, a 10 inch by 8 inch hole was blown in the lower wing surface which extended through to the upper wing. Structural and system damage included severed ribs and a damaged wire bundle. The wire bundle, comprised of several hundred wires, needed to be repaired in order to get the plane flying again.

"Assessing the damage to aircraft wires has always been a time-consuming and difficult task," said Senior Airman Bobby Lynch, member of the exercise analysis team. "But it is a necessary one in order to get our planes back up in the air."

For this exercise, the team used a new computerized wiring maintenance system, which cut their assessment time in half. The system was developed to give the technician access to a computerized database of the entire aircraft wiring system.

"Under normal conditions, troubleshooting the wires would take anywhere from 24 to 48 hours," said Airman Lynch, "Instead, we were able to find and fix the F-15 wiring problem in less than 12 hours."

Airman Lynch inputted the aircraft's tail number into the

wiring maintenance system, which then provided him with specific information about the aircraft's wiring scheme. Using the system along with wiring technical orders allowed Airman Lynch to accomplish the repairs in a fraction of time.

"I wish I had this system on the flightline," said Airman Lynch. "It would make it faster and easier to get damaged planes back in the fight."

The wiring maintenance aid developed by Booz, Allen & Hamilton, Inc., for Air Force Research Laboratory can also be used in more traditional maintenance operations, according to Mr. Mathias Kolleck, a senior associate at Booz, Allen & Hamilton, Inc.

"In this mode, technicians can access a list of problems associated with any system they may be working on to determine its cause," he said. "The maintenance aid will respond with the connector and wiring data associated with the problem."

This tool helps to improve a unit's operational readiness rate and the Air Force is also able to reduce ownership, said Mr. Kolleck.

Right now, the system is specific to the F-15, but Mr. Kolleck hopes that will change. "Our goal is to eventually expand the database to include all aircraft and then get the system into the hands of every Air Force technician," he said.

To help achieve this goal, a proposal to expand the database to include the KC-135 aircraft and update existing F-15 data was submitted to the Productivity, Reliability, Availability and Maintainability Program Office. A return on investment of 103:1 has been calculated for this project, which means that for every \$1,000 invested, the Air Force will save \$103,000.

— Staff Sgt. Ken Dockery, 653rd Combat Logistics Support Squadron

Robins Air Force Base, Ga., and the 19th Air Refueling Group stepped into a new era July 6 with the arrival of the first Pacer CRAG KC-135. The Pacer Compass Radar and Global Positioning System, or CRAG, program represents the Air Force's commitment to modernizing the KC-135 refueling fleet to extend the functional life to 2040, the airframe's projected decommissioning date.

System modifications are significant. They reduce the crew to three, including pilot, copilot and boom operator, through the means of integrated electronic navigational systems.

Other modifications include state-of-the-art color weather radar, improved compass and radar systems and an on-board global positioning system. An additional safety measure, the traffic collision avoidance system, aids in formation flying.

One of the most impressive modifications is the introduction of multifunction displays, allowing pilots to monitor several important aspects while only having to concentrate on one area of the plane's controls.

Unlike many technological improvements which increase the amount of maintenance required, Air Force studies show Pacer CRAG modifications reduce annual maintenance costs by approximately \$10 million. The maintenance data came from a comparison over mean time between failures, time to repair and maintenance costs the Air Force ran in 1994 on a fleet of 600 aircraft. Pacer CRAG KC-135s flew 538 more hours before experiencing any failures and average maintenance time dropped from 168 minutes (old) to 30 (Pacer CRAG).

Although the modified aircraft promise better operational efficiency, the changeover period also presents several challenges for the group, said Maj. Mike Koehler, 99th Air Refueling Squadron assistant director of operations. He said that scheduling aircrew upgrade training while maintaining a full operational tempo and monitoring crew qualifications is difficult due to the limited number of instructors.

However, aircrew members are stepping up to the challenge. Capt. Ron Peters said he is "ecstatic" about the modifications and is "aggressively anticipating" his introduction to Pacer CRAG.

Some in the squadron have already had the chance to fly the modified tanker during a recent five-day trip to Puerto Rico refueling F-18 Hornets in support of a Navy Atlantic fleet operation.

While the Pacer CRAG modifications allow crews to fly without the aid of a navigator, the 99th ARS will retain a large portion of its current navigator force. With the reduction in KC-135 navigator flying commitments, many such personnel will be free to move into staff functions within the squadron or group and will continue to play a major role in special operations air refueling, a critical mission that requires a navigator on board. A small number of navigators at Robins will be assigned to other flying and non-flying positions in the Air Force depending upon the qualifications and experience level of the individual officers.

Despite initial difficulties that might be encountered in converting the existing fleet to Pacer CRAG specifications, the long-term benefits will more than justify the conversion, said Maj. Koehler. Reductions in maintenance time and costs, as well as crew staffing, will free up additional resources to be used in other more needy areas. The modifications will also help extend the functional life of the KC-135 fleet while simultaneously increasing safety factors in a number of areas.

— 2nd Lt. Shaun Bellamy, 19th Air Refueling Group

KC-135 extends life with new CRAG technology



A KC-135 from the 22nd Air Refueling Wing, McConnell Air Force Base, Kan., refuels a B-2 Spirit from the 509th Bomb Wing, Whiteman Air Force Base, Mo. (U.S. Air Force photo by Senior Master Sgt. Rose Reynolds)

Air Force, Navy test-pilot schools fly together

The U.S. Air Force Test Pilot School, or TPS, at Edwards Air Force Base, Calif., recently hosted members of the U.S. Naval Test Pilot School as part of an exchange program to further grow the Chuck Yeagers and Neil Armstrongs of tomorrow.

The twenty-year-old tradition provided Navy test pilots, navigators and systems engineers a chance to fly in Air Force aircraft such as the T-38 Talon, F-15 Eagle, F-16 Fighting Falcon, KC-135 Stratotanker and the B-1 Lancer.

Conversely, Air Force training pilot senior class students flew the Navy's F-18 Hornet and U-6 Beaver, as well as the Army's UH-60 Blackhawk while visiting Naval Air Station Patuxent River in late August.

Experience in a broad range of such aircraft is key to graduating test pilots who must be able to handle any flight situation, said Col. Steve Cameron, test pilot school commandant.

"Book knowledge can only go so far toward preparing our graduates for the wide range of events an experimental aircraft can throw at them," he said.

"Flight test history shows that probably the biggest single contributor to the success of test pilots is the breadth of their experience," said Col. Cameron.

Consequently, technical exchange between the two schools is critical to their success. Flight experience gained by the 35 visiting Navy students here — and Air Force students in Maryland — furthers their qualitative evaluation skills, or more specifically how they practically apply flight test techniques.

"We get the chance to go up and take a quick snapshot of each aircraft's performance, handling qualities and systems," said Capt. Greg Gilbreath, a test pilot school student.

Though hands-on flying experience takes priority in the exchange program, facility tours and aircraft program briefings

further help each service's students understand how other test centers do business.

Accordingly, the Navy members toured the NASA Dryden Flight Research Center and the Avionics Test and Integration Complex here, and received briefs on the F-22 and Joint Strike Fighter, or JSF, programs.



U.S. Air Force Test Pilot school instructor Maj. Phil Edwards, left, prepares Lt. David Ramsey, a U.S. Naval Test Pilot School student, for an exchange program training sortie. (Photo by 1st Lt. Cris L'Esperance)

"Just seeing another test center is a great lesson — what other test facilities exist, how they use test ranges, how each school trains its students and what unique programs are evolving," said Maj. Peter Hughes, chief of systems and instructor pilot for the C-12, T-39 and B-1.

Maj. Hughes also stressed that

the joint perspective gained through the exchange is invaluable to graduates who may work in joint programs, such as JSF and CV-22 Osprey.

"We may very well be working as one team in the future and this opens up unique relationships that we wouldn't ordinarily have."

The exchange also allowed Col. Cameron to meet with the skipper of the Navy's TPS, Cmdr. Bob Stoney, and the headmaster of the British TPS, Wing Commander David Best.

The four international military TPSs, to include the French test pilot school, last met in March in Boscombe Down, England.

"The U.S. Air Force TPS is very proud of the cooperative, yet competitive relationship we have built with our sister schools here and abroad," Col. Cameron said. "The synergy between the schools definitely creates a better TPS graduate, both for our nation and our allies."

— 1st Lt. Cris L'Esperance, AFFTC Public Affairs

Old warbird finds new home at Tinker

It may be one of the strangest sights a driver could ever expect to see — a B-52 Stratofortress in their car's rearview mirror. For 20 years, this particular B-52 was a staunch defense, supporting Strategic Air Command missions both stateside and in Southeast Asia. Since then, it has been a static display, a community's show of pride in their contributions to national defense.

A new mission

A crowd gathered Sept. 20 to see the 170-foot long trailer carrying aircraft 56-0692 make its three-day migration down back roads and highways from Kelly Air Force Base, Texas to Tinker AFB, Okla. Now, Tinker has a new mission for the warbird as a training asset for a new generation of 654th Combat Logistics Support Squadron aircraft maintainers to master.

"The planning started a year ago," said Tech. Sgt. David Cummings, hydraulic specialist. "We started removing it from its display site June 25 and completed disassembly Sept. 10. The B-52's gross weight is around 160,000 pounds and it's taken a team effort to make this move work. We had to use ten trucks to move all components."

Dismantling an aircraft is an exercise in patience as well as skill. It took about one week to remove the leading edge from a single wing. Sgt. Cummings said the B-52 move reflects the combat logistics support squadron wartime mission — aircraft battle damage repair. When aircraft are damaged in the field, squadron teams deploy to restore the aircraft to mission-ready status.

This B-52 offers Tinker's squadron personnel a chance to practice those skills, which Master Sgt. Dennis Brown, B-52 element superintendent for combat logistics support squadron, said makes the last few weeks a good investment.

On-the-job training

"We've invested approximately 7,400 manhours just taking it apart," Sgt. Brown said. "We learned an immense amount of information about the B-52 by taking this one apart."

The people in this element have also proven that they can accomplish any project we give them. To the best of my memory, our squadron has never done anything this big before. This is quite possibly the biggest thing we've ever attempted."

The B-52 has considerable corrosion after being idle at Kelly for approximately 20 years, complicating the deployed squadron team's efforts to get the Stratofortress ready for transport. Sgt. Brown added that the 654th squadron must still reassemble the aircraft on their training pad area.

Sgt. Brown said that all aircraft battle damage repair personnel would have the opportunity to work on their newest trainer. Supply and transportation specialists from the 654th also received training by preparing various aircraft components and fabricating a custom-made fuselage cradle for the 500-plus mile journey to Tinker.

Overcoming obstacles

Extensive coordination, Sgt. Brown added. Separating tail fins from the main fuselage and securing the approximately 160-foot long fuselage to a tractor-trailer were also challenges.

Other aircraft battle damage repair personnel from Kelly's 651st Combat Logistics Support Squadron and reservists from the 433rd Combat Logistics Support Squadron helped make the project a success. According to Tech. Sgt. Richard Barringer, assistant deployed team chief, the 654th Combat Logistics Support Squadron will make the best use possible out of their newest training asset.

"Many people at Kelly were sad to see it go," he said, "but we'll take good care of it for them. We'll use it for training because we have a lot of young troops who need to experience aircraft battle damage repair scenarios in the field. We're the only support squadron crew in the country that could've done this and, with our help, this aircraft will continue to provide a valuable service to our nation's defense."

— Mr. Andy Stephens, OC-ALC Public Affairs



Top photo: A final wide turn and the fuselage of the B-52 bomber enters its new home.

Left photo: Members of the 654th Combat Logistics Support Squadron at Tinker Air Force Base, Okla., watch as cranes gently lift the old bird.

Disassembled into 69 pieces, the bomber was moved by truck from Kelly AFB, Texas, arriving at Tinker on Sept. 22. Squadron members will rebuild the B-52 bomber. (Photos by Ms. Margo Wright, OC-ALC)



Lives, aircraft threatened by common household cleaners

“People don’t realize that something that is safe for Bambi can blow an aircraft out of the air.”

Senior Master Sgt. Ken Foley

Formula 409 is the all-purpose cleaner according to its ads, but the Air Force is learning that purpose doesn’t extend to aircraft use. Unauthorized cleaners, like Formula 409, are causing aircraft corrosion and deterioration, contributing close to \$1 billion worth of damage each year.

“One of the maintenance procedures that is taken for granted is surface cleaning,” said Senior Master Sgt. Mark Foley, Air Force Systems Corrosion Manager, Air Force Corrosion Prevention Control Office, Robins Air Force Base, Ga. “But, it is during this mandatory and routine process that the most serious initiation of corrosion and hydrogen embrittlement occurs.”

Many of the non-technical-order approved cleaners have been available to the military for years, and have proven themselves as great cleaning agents. The problem with unauthorized cleaners is they were designed and approved for industrial degreasing, not cleaning high-strength aircraft alloys, said Sgt. Foley.

Even if they state they are environmentally friendly, these chemicals can cause sudden catastrophic failure of the aerospace equipment coating system, which protects the aircraft from deterioration. The main problem is that it does this with little or no warning.

“People don’t realize that something that is safe for Bambi can blow an aircraft out of the air,” said Sgt. Foley.

One of the most devastating effects from unauthorized cleaners is hydrogen embrittlement, which causes a metal to “decay” from within, according to Sgt. Foley.

Embrittlement causes tiny atomic cracks, undetectable with the human eye. It leads to the overall weakening and potential failure of a structure.

“If embrittlement were to take place on such high stressed areas such as landing gear components, the results would be catastrophic,” said Sgt. Foley. “It could possibly cause the gear to break off during landing.”

Unprovoked crashes and possible grounding of aircraft would cost billions of dollars in repairs and replacement, along with the most devastating of losses — human life.

“We are spending almost a billion dollars fixing problems that can be prevented,” said Sgt. Foley. “Instead, we could be spending that money where it would benefit Air Force people.”

— Capt. CK Keegan, AFMC Public Affairs



Simple Green has been shown to be one of the worst cleaners for corrosion and embrittlement.

Unauthorized products that may be found in the maintenance area

For a detailed list of authorized cleaners, go to www.afcpo.com/archives/pubs/cleanern.pdf

Simple Green
Scrub-No-More
Soil Away
Grime Kleen
Wash-No-More
Fly Away
Purple Power
Fab
X-Caliber
De-Solv-It

Isopar M
Grime Away
Citroclene
Grime Scat
Siege
Exxate 1000
F0425VR
DBE
Kleen Away
Armor-All

Tide
Cold Power
MOK
Tuff Job Degreaser
Klene Away
Beyond 2005
3D Supreme
Desolv-it
EPA 2000
EP 921

Big Blue
Uniclean VII
Precision Clean
PF5060
PF Solvent
Dirt-B-Gone
409
Gentle Clean
Wax Me Not
Rinse Not Wash

Citruclene
No Wash Wax
Dust Buster
Comet
Natural Orange Powder
3D Supreme
Citragold
F0425A
Planisol
Citrakleen

Hidden Hero

Off-duty Airman saves child's life

In a child's moment of need, a hero appears to save the day and then vanishes, leaving few clues as to his identity.

It wasn't a silver bullet left at the scene that identified the rescuer, but people in the local community familiar with Tinker Air Force Base, Okla., desperate to recognize the airman's act and answer the question: Who saved little Michael?

Ms. Paula Pittman loves her youngest grandchild, 3-year-old Michael, with all her heart. She describes him as "my world." While driving through Del City Aug. 30, she thought her family had lost that precious life to a simple piece of candy.

While stopped at an intersection around 4 p.m., Ms. Pittman looked back and was horrified to see Michael breathless and blue. Finding a peppermint wrapper in his hand, she knew the candy was lodged in his throat.

Desperate seconds

"Everything I'd been trained to do had been on adults, not children," she said. "I wasn't doing anything right and no one was stopping to help. You just panic at some point because everyone is just driving around."

"They didn't realize my grandson is going lifeless in my arms. People are honking for me to get out of their way, I'm screaming for help and no one's stopping to help."

Help arrived

Then it happened. A man in an Air Force battle-dress uniform came running across the street through the rush hour traffic. Ms. Pittman told him her grandson was choking on a piece of candy. The stranger in uniform said he had emergency medical technician training and not to worry.

With careful hands, the airman bent Michael's limp form over his knee and performed the Heimlich maneuver for children. The lodged candy came out with the first blow.

As Michael came to, the first person

he saw was the relieved face of his rescuer. The airman returned the child to his grateful grandmother, but checked over the crying 3-year-old a second time to make sure he was still breathing.

Ms. Pittman said Michael quickly calmed down, aware of something happening, but unable to communicate its importance.

"Hey, can you give me a high-five?" the airman asked Michael. The boy responded by holding up his hand and the rescuer followed through with the gesture, reassuring the child that everything was going to be all right.

After a policeman pulled up moments later, the airman left without a word, never once giving his name.

"It was a horrifying experience that I never, ever want to go through again," Ms. Pittman continued. "Michael's only 3, but he knows that man saved his life. We live for these grandchildren. They're all that matters in this world. He's not going to disappear out of our lives that easily. He needs to be thanked with all the gratitude that we have."

Ms. Pittman was going to make good on her promise: no good deed goes unrewarded. She was going to find her hero.

Searching for a hero

In the whirlwind of events, there were only two clues to the airman's identity — his uniform and the word on the nametag, "Lupp."

She went to Mr. Don Moore, a close friend and retired airborne computer technician from the 552nd Air Control Wing, and asked for his help in tracking down the man who'd made such a difference in her family's life.

"Being retired Air Force, I still have contacts and know the way the Air Force works," Mr. Moore said. "I was able to get around some of the roadblocks she faced trying to find a military member. That somebody would do such a thing and not wave his own banner. When I see somebody do the right thing, they need to be held up as an example. He did everything perfect, everything right



Staff Sgt. Jeff Lupp, crew chief for the 507th Air Refueling Wing, holds Michael during a recent tour of the base.

to save a life."

Associated with the base since he was a child, he knew whom to call. The base locator had no record of any person named Lupp and a call to civilian personnel revealed that there was no one by that name in the Air Force.

As a financial planner, Mr. Moore researches options on behalf of his clients and the hero hunt had become a test of his investigative prowess as well as a personal quest. He found another clue in the telephone book, an older gentleman whose son worked at Tinker as a reservist. As the elder Lupp described his son, Mr. Moore knew he'd found his man.

"I'm proud of the fact he's part of our Air Force," Mr. Moore continued. "There are good people out there. I'm proud of the fact this man is affiliated with our military services because, when all these other goobers out there were passing a woman standing in the middle of the road, holding a lifeless baby in her arms, he was the one who stopped, controlled the situation, saved a life and disappeared into the mist."

Finally found

The airman who acted in the heat of the moment was Staff Sgt. Jeff Lupp, a KC-135 crew chief for the 507th Air Refueling Wing at Tinker. He was on mandays the week of Aug. 28, perform-

— Continued on page 25

Grandmother kicks her way into hall of fame

At 5 feet 7 inches tall and 53 years old, Ms. Delva Mandrell, an aircraft sheet metal mechanic helper at Tinker Air Force Base, Okla., is probably capable of taking down the largest guy here. Just last month, she was inducted into the International Kempo Karate Institute's Masters Hall of Fame in Newport Beach, Calif.

After 25 years of practicing, Ms. Mandrell is the proud owner of a fourth degree black belt in Tae Kwon Do, a second degree black belt in Shihan-Ryu and U.S. Ju-Jitsu and a fourth degree black belt in Shihan Ryu Karate-do. She also holds a lower belt in Okinawan Goju-ryu and Judo.

A dream come true

Ms. Mandrell likened being inducted into the Hall of Fame to receiving an Oscar. "Your whole life is being recognized. It's a dream come true for a small-town girl. Out of 59 inductees, only four or five of us were women — it was very impressive.

"Martial arts is my way of personally fighting against crime in the street," she said. "I realized that all martial arts have

something to offer and, if I linked them together, they would complete a strong circle of knowledge with which to protect myself." She has competed in more than 100 tournaments and sponsored many others through the years.

"When I first started this, a friend asked me to accompany her to a class because she was afraid to attend alone," said Ms. Mandrell. "When I got to the class, she wasn't there and I became the only woman in the class. The attitude of members in the class was negative and it was clear they didn't want a woman there. The more I felt and heard, the more determined I was to stay in the class."

Ms. Mandrell came to Tinker as a helper so her husband, Gerald, a unit chief for the KC-135 Post Dock, could retire after 35 years of federal service. She spends her days as one of two women crewmembers working on the heavy structures of the aircraft and can often be seen out on a wing wearing a harness rig. Now that she's a full-time employee at Tinker, she continues to teach her martial arts school at night.

Helping others

This mother of three and grandmother of two has also devoted her time to working with the police department rape crisis centers and the Department of Health Services to gather as much information on self defense as she could. She gave that information back to communities in the form of free demonstrations and speeches at churches, schools, senior citizens centers and organizations of every kind.

"I even gave demonstrations in front of Wal-Mart stores and on the main streets of local small towns during their heritage days," she said. The ability to protect one's self was so important to her that she had to share it with as many people as she could.

"Many of the people in my classes are not just there to learn to fight and get trophies," she said. "There are kids that are facing bullies at school, women who are being abused, rape victims," Ms. Mandrell said. "I feel it's my duty to help these people seek counseling and learn emotional and physical discipline and strength through martial arts training. When I tell someone they're doing something wrong, I also tell them four or five things they're doing right — most people need positive reinforcement and many of those I teach have been victims in their life."

On being humble

Ms. Mandrell believes humility is very important in the martial arts world. When she was first nominated for this induction, she had decided she would not attend the ceremony if she were awarded. "A humble person wins a trophy for being humble, but when they accept that award they are no longer humble. I don't want to be that way," she said.

"But my husband said we were going to go, so we did," she said. "I'm afraid a lot of the new instructors are feeling very important as they rise through the belt levels and are losing their concern for their students.

"Even though this award means the world to me emotionally, there are too many people out there who really need my help to waste time thinking I'm too good," she concluded. "I'm a helper and a fixer by nature and now by job, and I'll continue with my classes and instructions for as long as I can. With God's help, it will be a long time."

— Ms. Gail Kulhavy, OC-ALC Public Affairs



(Photo by Ms. Margo Wright, OC-ALC.)



Rome pays tribute to Air Force Medal of Honor recipient

One of only five Air Force enlisted members to ever receive the Medal of Honor was remembered Sept. 15 during ceremonies at the Air Force Research Laboratory Rome, N.Y.

The Rome Enlisted Association honored the late Tech. Sgt. Forrest L. “Woody” Vosler during ceremonies attended by his sister, two sons and two grandsons. Sgt. Vosler was a 20 year old when he enlisted in the Army Air Corps. On Dec. 20, 1943, he was serving as a radio operator and gunner aboard a B-17 returning to England from a mission over Germany. The aircraft was severely damaged and Sgt. Vosler seriously wounded by enemy anti-aircraft fire. Unable to see due to his injuries, he used his sense of touch to repair a damaged radio and dispatched a distress signal as the plane prepared to ditch at sea. Once in the water, he kept a wounded crewmate from slipping off the plane’s wing until other crewmembers could help both

into a life raft.

For his actions, he received the nation’s highest military decoration, presented by President Franklin Roosevelt on Aug. 29, 1944. Following his discharge in October 1944, he earned a degree, and then spent 30 years with the Veteran’s Administration in Syracuse, N.Y., counseling veterans and performing community service. He died Feb. 17, 1992, and is buried in Arlington National Cemetery.

Members of his family were presented with two pieces of artwork depicting his plane, “The Jersey Bounce,” ditching at sea and a B-17 raid over Germany, and a plaque with the sergeant’s likeness and a brief description of his last mission. The final presentation was a shadow box containing an American flag that flew May 25, 2000, over Molesworth Air Station, England, the site which Sgt. Vosler’s crew departed on that fateful December day nearly 58 years ago.

— Mr. Francis L. Crumb, AFRL Public Affairs

— *Continued from page 23*

ing on-the-job training.

His first job with the military had been as an emergency medical technician and he renews his CPR certification to keep his life-saving skills sharp.

During the morning of Aug. 30, Sgt. Lupp accidentally cut his hand and when he headed home at the end of the day, he decided not to take I-240. Instead, he drove down 59th Street, expecting a less tumultuous route.

“I saw this car stopped and thought it was an accident,” he began. “When I saw the lady holding the little boy in her arms, I’d thought he’d fallen out of the car. Because I had EMT training I just stopped to see if there was something I could do. I ran over to her and performed the Heimlich on a child the way I was taught: face down, over the knee,

with a firm thrust to the back.”

He said he stopped because he was brought up on the Golden Rule: Do unto others as you would have them do unto you. When he found out the next day that Ms. Pittman had been looking for him, he said it was hard to sleep that night, knowing what an impact he’d made on a family by stopping to help.

Sgt. Lupp remembered Michael’s high-five. He remembered leaving because he’d done all he could do, and it was enough. He still remembers the intense feeling of satisfaction. He downplays his involvement, a little embarrassed by the attention and flattered by Ms. Pittman’s perseverance, but his actions spoke volumes.

“Somebody had to help,” he said. Someday soon, Ms. Pittman hopes to

meet up with Sgt. Lupp again and thank him properly. Ms. Pittman was surprised to find that her child’s rescuer helps maintain some of the aircraft that fascinate her grandson so much.

He loves to hear Tinker’s aircraft when they fly over his house, she said, and the idea of someone who works on those same aircraft being responsible for saving her grandson’s life was too incredible to believe.

“The Air Force defends the nation on many fronts,” Ms. Pittman said, choking back tears. “Even in our own backyard. I don’t want to think about what would’ve happened if he hadn’t stopped.”

— Mr. Andy Stephens, OC-ALC Public Affairs

Civilian of the Year scoops five awards

EGLIN AIR FORCE BASE, Fla. — An aircraft survival and flight equipment repairer with the 46th Operation Support Squadron, or OSS, here received the Air Force Life Support Civilian of the Year Award.

Mr. Allen Schoenwetter accepted the award from Col. Kenneth Tribular, personnel recovery division chief at the Pentagon during a life support and survival conference held recently at Luke Air Force Base, Ariz.

This marks the fifth major award Mr. Schoenwetter has claimed within a year.

"He has only been here for a year and already he is my number one wage grade employee," said Lt. Col. Lawrence G. Avery Jr., 46th OSS commander.

"I was flabbergasted," Mr. Schoenwetter said, "I have never received any award before this past year."

In 1998, Mr. Schoenwetter was a parachute rigger with the 46th Maintenance Support Squadron here. After working there since 1988, he fell victim to downsizing and lost his job.

"However, another window of opportunity opened and I was fortunate to walk out of my old job and into my new one," he said.

As part of the selection process for Civilian of the Year award nominees, the unit commander submits detailed essays justifying why the nominee should win the award. The essays contain the nature of the achievements the nominee has done and how the achievements impacted mission procedures.

Among Mr. Schoenwetter's achievements are performing more than 300 aircraft installed equipment inspections on



multiple airframes: F-15, F-16, and A-10, and his by-the-book maintenance and safety practices resulted in zero discrepancies and no cancelled missions, Col. Avery said. He also modified 136 anti-G suit pockets to prevent a common deficiency found during routine maintenance.

"I come in every day and give my job 100 percent," Mr. Schoenwetter said. "Keeping a positive attitude is important."

— Reported by Airman Emily Butali, AAC Public Affairs

Four inducted as Fellows

WRIGHT-PATTERSON AIR FORCE BASE, Ohio - Air Force Research Laboratory recently selected four scientists and engineers for an award, which confers a lifetime status, recognizing outstanding contributions in research and development and technical program management.

Selected from a field of nominees across the lab, were:

— Dr. Edward E. Altshuler, Sensors Directorate, Hanscom AFB, Mass. An internationally recognized expert in the field of electromagnetics.

In the early 1960s he investigated the feasibility of using the millimeter-wave region of the spectrum for military applications. He recognized that high-gain, high-resolution antennas of moderate size, and the compact, lightweight system components that can be obtained at these wavelengths, were applicable to space vehicle instrumentation.

More recently, he received a patent for a process for the design of antennas using genetic algorithms.

— Dr. Susan Gussenhoven-Shea, Space Vehicles Directorate, Hanscom. She is recognized as a leading expert in three areas of space research: auroral physics, spacecraft charging and space radiation effects.

During her time with the lab, she has garnered leadership roles in the spacecraft charging at high altitudes, and combined release and radiation effects satellite programs.

— Dr. Daniel B. Miracle, Materials and Manufacturing Directorate, Wright-Patterson, whose research has led to significant advancements in intermetallic alloys and metal matrix composites.

His early studies on intermetallic alloys contributed to the successful engine demonstration of an advanced single crystal vane alloy, which has shown a dramatic improvement in the thrust-to-weight ratio of advanced gas turbine engines.

His recent research contributed to the first Air Force specification of a fiber-reinforced metal matrix composite, resulting in a \$26 million savings to the Air Force.

— Dr. Daniel Repperger, Human

Effectiveness Directorate, Wright-Patterson, who has established himself as a leader in the scientific community by modeling human control performance in complex flight motion environments.

His patent was the original in the field of haptic control devices, which has become widespread in the computer game and flight simulation industry. The technology has also been applied to the field of rehabilitation.

The four will be honored during the AFRL Fellows induction ceremony banquet November 7 at the United States Air Force Museum here.

— Reported by Mr. Tim Anderl, AFRL Public Affairs

Society presents top award to AFRL scientist

KIRTLAND AIR FORCE BASE, N.M. — Joining past honorees, such as Walt Disney and Jacques Cousteau, Air Force Research Laboratory senior scientist Dr. Robert Q. Fugate received the Photographic Society of America's highest honor at the society's annual conference and banquet Sept. 9 in

Albuquerque, N.M.

The Progress Medal Award, presented for the art or science of photography was awarded to Dr. Fugate, technical director for the Starfire Optical Range, a major division of AFRL's Directed Energy Directorate, Kirtland Air Force Base, N.M.

Dr. Fugate received the award for his research and development work in adaptive optics — special mirrors that, when used with lasers and computers, can change their shape to compensate for the distorting effects of the atmosphere.

This technology is allowing astronomers to more clearly view planets, stars and other objects in space.

Adaptive optics is also an enabling technology for using a laser to power satellites. This technique could transfer large amounts of energy for battery recharging, orbit maneuvering or possibly boosting satellites from low-earth orbit to a geosynchronous orbit.

— *Reported by AFRL Public Affairs*

Laser team wins international award

KIRTLAND AIR FORCE BASE, N.M. — The International Test and Evaluation Association presented the "Airborne Laser Star" scintillometer test team with the 2000 Special Achievement Award at a ceremony in Hershey, Pa., Sept. 7.

The award salutes the team for collecting data showing how the atmosphere would influence a beam of laser light fired over a long distance, in effect taking the "twinkle" out of starlight to compensate for atmospheric disturbances.

The data was collected by a team of 54 people from nine organizations around the country during a series of three six-week deployments to the Middle East and Korea. To measure the data, the team used a sensor the Air Force Research Laboratory developed specifically for use in climatically difficult environments.

It was the first time optical turbulence had been directly measured. It also marked the first time the team was able to use a process that team members devised to keep fuel from freezing at altitudes between 39,000 feet and 47,000 feet.

"The outstanding results the team compiled allayed the fears of the office of the Secretary of Defense and Congress resulting in the Airborne Laser staying on schedule and on cost,

avoiding hundreds of millions of dollars in threatened delays," an International Test and Evaluation Association spokesman said.

— *Reported by 377th ABW Public Affairs*

Top Founders Award goes to USAFSAM scientist

BROOKS AIR FORCE BASE, Texas — Dr. Thomas J. Tredici, a U.S. Air Force School of Aerospace Medicine, or USAFSAM, senior scientist-ophthalmologist, recently received one of the Aerospace Medical Association's highest honors — the Louis H. Bauer Founders Award.

The award, established in honor of AMA's founder, is presented annually for the most significant contributions made in aerospace medicine.

The spirit with which the award is given is based, in large measure, on an AMA member awardee's "lifetime achievement."

Dr. Tredici has spent most of his career making major contributions to aerospace ophthalmology.

"If you get rewarded for something you do, it inspires you to go on," said Dr. Tredici.

At 78, the world-renowned scientist continues to lecture at USAFSAM and overseas on an occupational subspecialty he helped found: aerospace ophthalmology.

Dr. Tredici and his staff helped establish and implement Air Force policy on glaucoma for aviators that has since returned over 600 USAF flyers to full flight status, and is one of our nation's leading authorities on the use of contact lenses in aviation. He helped return the first Air Force aviator to flying status in 1969 using contact lenses after the latter had cataract surgery.

By 1976, his research team had perfected techniques involving intraocular lens implantation in aviators following cataract surgery. This technique allowed aviators to maintain flying status in any type of aircraft.

Additionally, he discovered the principle reason for depth perception failure in aviators. This led to his staff's development of the Night Vision manual used today by all Air Force flight surgeons.

Other major contributions Dr. Tredici and his staff made include the development of protective visors against flash blindness and retinal burns that might be produced by nuclear weapons, and the subsequent development of the first

Department of Defense laser laboratory built at Brooks in 1969.

He was instrumental in developing a windscreen lab to evaluate visual distortions in new multi-layered windscreens and an electrophysiology lab that today ranks among our nation's best.

Prior to Apollo 11's historic moon mission, Dr. Tredici and his staff developed criteria for visors to protect astronauts from potentially blinding ultraviolet energy.

— *By Mr. Rudy Purificato, 311th Human Systems Wing*

Squadron wins outstanding unit award

TINKER AIR FORCE BASE, Okla. — For the first time ever, the 10th Flight Test Squadron at Tinker received the Air Force Outstanding Unit Award.

The award was presented by Gen. Lester Lyles, AFMC commander, Sept. 13. The squadron was one of only two squadrons considered.

"You, the members of the squadron, are doing a yeoman's job of deploying the flight test operations here on Tinker, and have been for many, many years," said Gen. Lyles.

The 25 members of the squadron flew 407 missions for 967 mishap-free flight hours from July 1, 1998, through Dec. 31, 1999. These missions are in support of the Oklahoma City Air Logistics Center's \$1 billion programmed depot maintenance of 10 models and series of the B-1B, B-52, C-135 and E-3 weapons systems.

The squadron's mission of testing aircraft flight capability, however, was made clear when they also flew 249 elevated-risk missions following depot maintenance.

"I think our position within the center puts us in a unique situation where we get to interact not just during depot check-flight test activities, but we also have an opportunity to be involved with the different product directorates," said Lt. Col. J.B. Smith.

"We make it a point to be involved and offer our expertise, our operational aircraft expertise, to the folks who are managing those systems."

Gen. Lyles led the attendees in ending the award ceremony with a resounding rendition of the Air Force song before he shook hands and thanked each member of the squadron.

— *Reported by Ms. Gail Kulhavy, OC-ALC*

Kosovo showdown spreads to Bosnia

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dy Marines to
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War Powers
gress of U.S.
the NATO ac-
e's suburbs
ets include
military airport at Bata
and other locations, said
Turn to page 3A

Talks fail, war looms

TENSION: President Bush doesn't rule out launching first attack after talks fail between Secretary of State James A. Baker and Iraqi Foreign Minister Tariq Aziz.

GENEVA (AP) — Secretary of State James A. Baker and Iraqi Foreign Minister Tariq Aziz met for six hours on Wednesday but failed to defuse the Persian Gulf crisis that threatens war in the Middle East. "The time for talk is running out," Baker said.

Od prices fell sharply in early trading as word spread that the talks had not broken apart abruptly, then soared within moments of Baker's pessimistic report of his session.

also official War Powers Congress of U.S. the NATO ac- e's suburbs ets include military airport at Bata and other locations, said Turn to page 3A



Baker Aziz

U.S. storms Iraq

Objective: Get Saddam out of Kuwait

DESERT STORM: U.S. troops moved into Iraq to overthrow Saddam Hussein's regime. U.S. troops are moving through Kuwait to Iraq.

Early targets in the Gulf included military bases and oil fields and command centers. "We're going to get Saddam out of Kuwait," said a Pentagon spokesman.

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The ground war in the Gulf is expected to be a long one.

Cohen says U.S. troops will aid peace in Kosovo

BY ROBERT BURNS
AP Military Writer

BONN, Germany — President Clinton intends to contribute American ground troops to a NATO peacekeeping force in Kosovo if negotiations in France produce a strong agreement, a NATO spokesman said.

Safety of U.S. troops is 'ensured' in letters

WASHINGTON (AP) — President Clinton has letters from Serbian, Bosnian and Croatian leaders promising the safety and security of U.S. troops in Bosnia.

Clinton's administration said the letters were part of a peace agreement to implement the Dayton Accords. The agreement calls for the implementation of a peacekeeping force in Bosnia.

Kosovo talks

BY JEFFREY ULBRICH
Associated Press Writer

RAMBOUILLET, France — The Kosovo peace conference headed into a high pressure final week with the United States bearing down hard on the Serbs to make a deal with rival ethnic Albanians or suffer NATO's wrath.

Ivanov told meeting with that he is committed to the implementation of the Dayton Accords. "I would like to see once again, a peaceful settlement," he said.

Time is running out

World braces for war

DEADLINE: The mood around the world is grim as the deadline for Iraq to get out of Kuwait turns to hours.

(AP) — With the approach of the U.N. deadline for Iraq to release Kuwait suddenly measured in hours, bids for peace were drowned out today by rumblings of war.

As the clock ticked toward a deadline today or midnight EST for Iraq to withdraw from the emirate

grim and the message one of resolve.

President Bush was briefed early today by his intelligence and national security advisers. Late Monday, he signed the congressional resolution, passed over the weekend, authorizing him to use military force to drive Saddam Hussein from Kuwait.

Members of the U.N. Security Council met into the early hours today and heard a sobering summary of U.N. Secretary-General Javier Perez de Cuellar's failed peace mission to Baghdad. Diplomats described the report as "somber" and "tragic."

The council was expected to discuss an 11th-hour French peace plan today, which would

What allies will back up the U.S.? The world is watching to see Bush's response. See page 2. A marine's day is brightened by birth of his daughter, see page 3.

for a U.N. peacekeeping force. But the offer of a Middle East peace conference, so Saddam would not fully lose face, was unacceptable to the Americans.

"We don't believe it's the appropriate time or the appropriate circumstances to present such a statement, certainly with the linkage that's involved in the text," U.S. Ambassador Thomas R. Pickering told reporters.

In Paris, Foreign Minister Roland Dumas said he would not visit Baghdad to promote the French peace initiative, a spokesman said. Dumas had said he

dent's vow that any war would become a popular war in Iraq.

Iraq's air force commander was quoted today as saying that the U.S. was not trained for suicide missions were ready for the "mother of battles."

Al-Thawra, newspaper of Iraq's ruling Baath party, said in a front-page editorial today that Kuwait is under Iraq and "will remain so forever."

"It is (President) Bush who wanted the war," said the army daily, Al-Qadisiya. "But let him know that the furnace of hell will be open to the Americans and to their allies when they come."

Saddam has sought to link resolution of the crisis to the Palestinians' quest

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